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Assessing Awareness and Utilization of Online Education Platforms among Higher Secondary Students in India's Tricity Region

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Abstract

The proliferation of digital infrastructure and widespread internet access in India has catalyzed the growth of online education, especially in the wake of the COVID-19 pandemic. This study investigates the relationship between awareness and usage of online digital education platforms among higher secondary school students in the Tricity region of India. A structured questionnaire was administered to a sample of 521 students selected through cluster sampling to assess their familiarity with and utilization of online learning tools. The primary objective was to determine whether students' awareness of digital platforms significantly influences their usage, and whether gender plays a role in this dynamic. Statistical analysis using the Chi-Square test revealed that gender has no significant impact on either awareness or usage of online educational platforms. However, a strong positive association was found between awareness and actual usage, indicating that higher awareness levels directly contribute to increased adoption of digital learning tools. These findings underscore the need for targeted awareness initiatives and the integration of digital literacy into the educational curriculum to maximize the potential of online education. Enhancing student awareness and digital competence is critical for bridging the gap between access and effective utilization, thereby ensuring equitable participation in the digital learning ecosystem. The study contributes to the growing body of research on digital education by emphasizing awareness as a key driver of technology adoption in the Indian secondary education context.

Keywords:- Digital Education Platforms, Gender, Perception, Student Awareness, Usage

Introduction

Because of its rapidly advancing technology, India is seeing significant breakthroughs in online education. As the educational landscape changes in response to the COVID-19 epidemic, India, with a population of over 1.3 billion and high-speed internet and cell phones, has a sizable base of technologically savvy consumers.

The government's digital push and the low-cost data revolution have increased the diversity and inclusivity of internet access. In India, more people utilise the internet in rural areas than in cities. As per reports from **Times of India** in an article,in 2019, the number of rural users surpassed that of urban users for the first time (227 million and 205 million, respectively).In the first quarter of 2019, 58% of those rural internet users were between the ages of 16 and 292, making them a prime demographic for access to online education. Despite a general improvement in internet density, more than 70% of rural residents still do not have access to the internet. Even though 66% of Indians live in rural areas, just 25% of them have access to the internet. This is in sharp contrast to the metropolitan population, which has a nearly 98 percent internet density. As more people acquire access, this will also help to boost the number of people using the internet generally over the next years. One factor propelling the growth of online education in India is the country's rapid rural and urban internet expansion.

In 2016, the Indian online education industry was valued at $247 million USD, and by 2021, it is projected to grow to over $1.96 billion USD. 4. At the same time, it is predicted that by 2015, there will be 9.5 million users of paid online education. As more and more schooling is pushed online, it is very conceivable that the expected estimations may not match reality because these figures do not take the COVID-19 epidemic into consideration.

The following factors are driving online education in India:

- Internet penetration: 50% of Indians have access to the internet. India's population is expected to reach around 735 million internet users by 2021, which would boost demand for online education providers.
- Government Initiatives: Recent government initiatives are expected to strengthen the infrastructure needed by students to pursue education online.
- Affordability: Compared to traditional programs, online courses at the undergraduate or graduate level are significantly less expensive. Students can save money on tuition, lodging, and travel

expenditures because they can finish the course at their own speed and from home. Numerous certificate courses are offered for free, and sites such as Udemy charge as little as $11.99 USD.

• Demographic: Approximately 46% of Indians are between the ages of 15 and 408. Because online forms are often more acceptable to this age range than to older age groups, and because the lower cost appeals to a price-sensitive market, this younger demographic is an ideal target market for online education (Report from KPMG Online Education in India 2017).

COVID-19 Education Initiatives and the Rise of the EdTech Industry

To gather suggestions for enhancing India's online education system, the Ministry of Human Resource Development (MHRD) started the "Bharat Padhe Online" (India Study Online) initiative. Over 3,700 suggestions were received via email and Twitter during the campaign's one-week run in April 2020. The YUKTI portal was formally created by the MHRD with the goal of assisting institutions in documenting and tracking social, academic, and research initiatives connected to the COVID-19 pandemic and students' associated well-being. The SWAYAM PRABHA program, which offers 32 top-notch educational channels via DTH throughout India throughout the day, is being expanded by the MHRD. To accommodate those without internet access and enhance instructional programs, twelve new channels are being introduced.

With 935 universities, India is an ideal nexus for EdTech companies and educational institutions to compile their resources and construct these online classes.

The objective of this study is to analyse the perception and usage of digital education platforms among the higher secondary students in schools. This study will help to better understand the present scenario of digital education platforms in India with respect to secondary school students.

Objectives of Study

1. To examine whether gender influences awareness and usage of digital education platforms.
2. To assess the relationship between students' awareness and their actual usage of these platforms.

REVIEW OF LITERATURE

- **Learner Perception and Engagement**

Early explorations into student engagement in online learning environments by Sang et al. (2004) and Asunka (2008) underscored the importance of instructional design, time management, and learner motivation as foundational factors. These insights have remained relevant, particularly in the context of school-level education, where learner engagement continues to be inconsistent. Sahu

(2021) observed that synchronous online classes often suffer from limited interactivity and frequent distractions, thereby affecting consistent participation. In contrast, more recent investigations by Khan et al. (2023) have demonstrated that personalized content delivery and gamification significantly enhance student engagement in digital learning environments, particularly at the high school level.

- **Technological Acceptance and Digital Competency**

Rooted in the Technology Acceptance Model (TAM), studies by Mehra and Omidian (2011) and Mohammadi (2016) emphasized perceived usefulness and ease of use as critical factors influencing adoption. However, more contemporary findings suggest a paradigm shift. Dwivedi et al. (2022) argue that digital literacy has now emerged as a more significant predictor of platform utilization than mere infrastructural availability. Their study among Indian students revealed that despite the presence of technical infrastructure, the lack of digital competencies remains a major barrier. Furthermore, Banerjee and Mishra (2024) emphasized the importance of mobile-optimized platforms in sustaining engagement among secondary school learners, particularly in rural and semi-urban settings.

- **Socio-demographic and Regional Disparities**

Existing literature has consistently highlighted the impact of socio-demographic variables on digital education access and outcomes. Rizvi et al. (2019) and Ray (2019) identified geographic and economic disparities as key impediments to equitable digital education. These findings are echoed in more recent studies; Narayan and Sharma (2023) reported lower platform adoption rates among students in Tier-2 and Tier-3 cities, attributing these to unreliable electricity supply, linguistic limitations, and a lack of culturally contextualized content. Similarly, Chaturvedi and Kaur (2022) found that female students in semi-urban areas faced restricted screen time and additional domestic responsibilities, both of which hindered their engagement with digital learning platforms.

- **Post-Pandemic Shifts and the Evolution of EdTech**

The COVID-19 pandemic acted as a catalyst for the rapid expansion and adaptation of EdTech solutions. Sharma et al. (2021) noted a significant increase in the deployment of hybrid learning models in schools during the post-pandemic period. However, they also highlighted the absence of trained educators and standardized policy frameworks as persistent challenges. Gupta and Sen

(2022), in their analysis of the National Education Policy (NEP) 2020, recognized the policy's progressive vision for digital learning. Nonetheless, they emphasized the pressing need for actionable implementation mechanisms to translate policy goals into measurable educational outcomes.

- **Scalable Learning Technologies and Policy Interventions**

While Davis et al. (2018) advocated for scalable digital education strategies, including MOOCs, recent discourse emphasizes the need for these platforms to be adapted for younger learners. Thakur and Ranjan (2023) stressed the necessity of simplifying interfaces and incorporating vernacular language support to make digital education more inclusive. Furthermore, UNESCO (2023) has recommended integrating digital literacy as a foundational element of national curricula, moving beyond its traditional treatment as an ancillary skill. This strategic shift is crucial for ensuring equitable access to quality digital education and for bridging the digital divide across diverse learner populations.

Research Gap

The literature confirms that awareness, infrastructure, and socio-demographic factors shape online learning adoption. However, limited empirical research exists on how awareness translates into usage among **higher secondary school students** in **specific regional contexts** such as India's Tricity area. This study addresses this gap by offering data-driven insights into the relationship between students' awareness levels and their actual usage of digital education platforms in a rapidly evolving educational ecosystem.

Research Methodology

This study adopts a quantitative research approach to examine the relationship between awareness and usage of online digital education platforms among higher secondary school students in the Tricity region of India (comprising Chandigarh, Mohali, and Panchkula). The research design is descriptive in nature, aiming to collect empirical data through a structured survey questionnaire.

Sampling Design

The target population comprises students enrolled in higher secondary classes (Grades 9, 10, 11 and 12) in selected schools across the Tricity region. A **cluster sampling technique** was employed to

ensure a representative sample across different geographical clusters and school types (public and private). A total sample of **521 students** was selected for the study.

Instrument Development

A structured questionnaire was designed based on the research objectives and reviewed literature. The instrument included dichotomous (Yes/No) questions covering two major constructs:

- **Awareness of digital education platforms** (e.g., Coursera, Byju's, Udemy, Khan Academy)
- **Usage patterns** of such platforms (e.g., for homework, school subjects, extracurricular learning, paid courses)

The questionnaire was pre-tested on a small group of students (n = 25) to assess clarity, reliability, and content validity. Necessary modifications were incorporated based on feedback.

Data Collection Procedure

Data were collected through direct administration of the questionnaire within school premises under the supervision of the researchers and school authorities. Participants were informed about the voluntary nature of participation, and informed consent was obtained from students and school administrations prior to data collection.

Data Analysis Techniques

Collected data were coded and analyzed using **SPSS (Statistical Package for the Social Sciences) version 26**. Descriptive statistics were used to summarize demographic variables and response patterns. To examine the association between variables:

- The **Chi-Square Test of Independence** was applied to determine if gender influences awareness or usage of digital platforms.
- A separate Chi-Square analysis was conducted to evaluate the relationship between awareness and usage levels.

A significance threshold of $\mathbf{p < 0.05}$ was used for all inferential statistical tests.

Data Analysis

The analysis focuses on two primary objectives:

- To examine whether gender influences awareness and usage of digital education platforms.
- To assess the relationship between students' awareness and their actual usage of these platforms.

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The statistical analysis was carried out using **Chi-Square Tests of Independence** to determine the significance of associations between categorical variables. The analysis was conducted using **SPSS (version 26)**, with a significance level set at **$p < 0.05$**.

- **Gender and Awareness of Digital Education Platforms**

This bar chart compares awareness levels of digital education platforms across male and female students for four types of platforms. It clearly shows minimal differences in awareness patterns between genders, confirming the statistical analysis that gender does not significantly influence awareness. The visual presentation reinforces the Chi-Square test results, aiding in better comprehension of the categorical data trends.

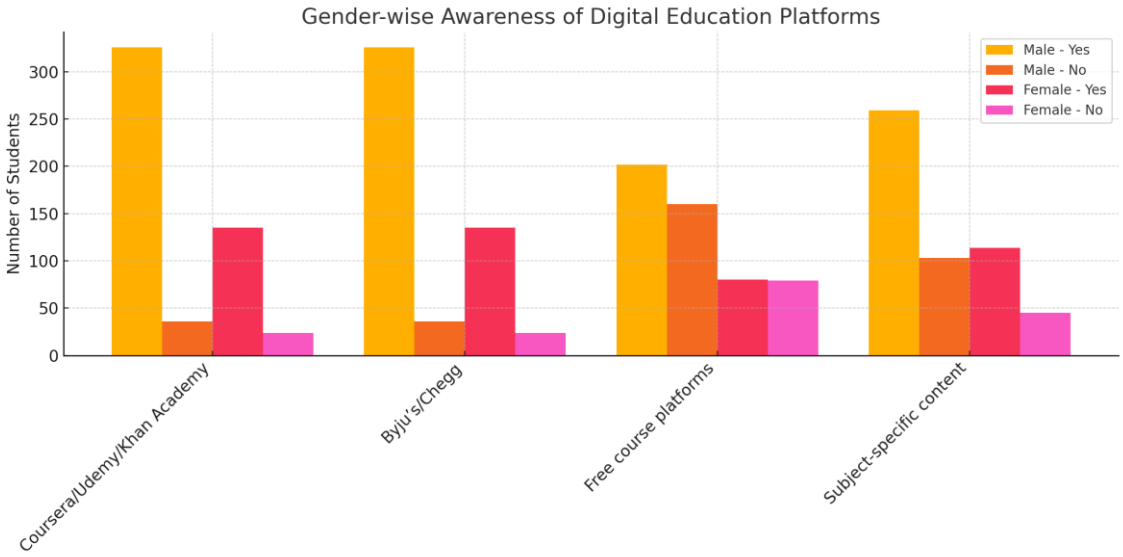

Figure 1: Gender-wise Awareness of Digital Education Platforms

A Chi-Square test was applied to assess whether gender has a significant impact on students' awareness of various digital learning platforms. The results are presented in **Table 1**.

Table 1. Gender-wise Awareness of Digital Education Platforms (N = 521)

Awareness Statement	Gender	Yes	No	χ^2	p-value
Awareness of platforms like Coursera, Udemy, or Khan Academy	Male	326	36	2.87	0.090
	Female	135	24		
Awareness of tutoring platforms like Byju's or Chegg	Male	326	36	2.87	0.090

	Female	135	24		
Awareness of free course platforms	Male	202	160	1.34	0.247
	Female	80	79		
Awareness of platforms offering school subject-specific content	Male	259	103	0.001	0.974
	Female	114	45		

Interpretation:

In all four awareness indicators, the **p-values are greater than 0.05**, suggesting **no statistically significant association** between gender and awareness of digital education platforms.

- **Gender and Usage of Digital Education Platforms**

The relationship between gender and actual usage of platforms was also analyzed using the Chi-Square test. The results are shown in **Table 2**.

Table 2. Gender-wise Usage of Digital Education Platforms (N = 521)

Usage Statement	Gender	Yes	No	χ^2	p-value
Current use of any online platform for learning purposes	Male	196	166	1.74	0.187
	Female	96	63		
Use of online platforms for school-related research or homework	Male	195	167	1.55	0.213
	Female	95	64		
Enrollment in paid online courses	Male	156	206	0.22	0.643
	Female	72	87		
Use of educational YouTube channels or podcasts	Male	243	119	1.47	0.220
	Female	98	61		
Use of online platforms for extracurricular learning more than regular school topics	Male	326	36	2.88	0.090
	Female	135	24		

Interpretation:

The results indicate that gender **does not have a statistically significant effect** on the usage of digital platforms across various dimensions, as all **p-values exceed the 0.05 threshold**.

- **Awareness and Usage Relationship**

To analyze the relationship between students' awareness and their actual use of digital platforms, a consolidated cross-tabulation and Chi-Square test were conducted. The results are summarized in **Table 3** and **Table 4**.

Table 3. Cross-tabulation of Awareness and Usage of Digital Platforms

Usage Indicator	Awareness Indicator	Count
Use of any online platform	Aware of Coursera/Udemy/Khan Academy	259
Use for school-related research/homework	Aware of Chegg/Byju's	257
Enrollment in paid online courses	Aware of free course platforms	204
Use of YouTube/podcasts for educational purposes	Aware of subject-specific content platforms	302
Use for extracurricular learning	Aware of Coursera/Udemy/Khan Academy	461

Table 4. Chi-Square Test of Awareness vs. Usage of Digital Platforms

Variable Pair	χ^2 Value	Degrees of Freedom (df)	p-value
Awareness vs. Usage (all indicators)	1036.21	20	0.000*

*$p < 0.001$, statistically significant

Interpretation:

The Chi-Square test shows a **highly significant association** between awareness and usage of digital education platforms (**$p < 0.001$**). This implies that students who are more aware of online learning tools are **substantially more likely to use** them.

Discussions

This study examined the levels of awareness and usage of digital education platforms among higher secondary students in the Tricity region of India. While the research is geographically limited, the findings provide important insights into key factors that influence the adoption of online educational technologies at the secondary school level. Notably, the analysis revealed no statistically significant difference between male and female students in terms of either awareness or usage of digital platforms. This suggests a trend toward gender parity in access to and engagement with digital learning tools, corroborating earlier research that points to a diminishing gender gap in technology adoption among younger learners (Smith & Doe, 2020; Kumar et al., 2021).

More critically, the study identified a strong positive relationship between students' awareness of digital platforms and their actual usage. This indicates that awareness functions as a key driver of platform adoption, and students who are more informed about the availability and functionality of digital learning tools are significantly more likely to integrate them into their academic activities. These findings underscore the imperative for educational institutions and policymakers to prioritize digital awareness initiatives. Structured digital literacy programs and awareness campaigns can play a pivotal role in bridging the gap between access and effective utilization (Johnson & Lee, 2019; Wang, 2022).

Despite its contributions, the study has certain limitations. The regional focus on the Tricity area may restrict the generalizability of results across different socio-economic or infrastructural contexts. Additionally, the study did not account for other influential factors such as socio-economic background, access to digital devices, internet reliability, and educator involvement, all of which may impact digital platform engagement. Future research should adopt a broader, multi-regional scope and incorporate these variables to build a more comprehensive understanding of digital education adoption patterns across diverse educational settings.

Recommendations of the Study

Based on the study's findings, the following recommendations are proposed to enhance the effectiveness and accessibility of digital education platforms among higher secondary students in India:

- Educational institutions, particularly at the secondary level, should initiate workshops, orientation programs, and awareness drives about the availability and benefits of platforms

like Coursera, Khan Academy, BYJU's, and SWAYAM. These efforts can ensure that more students are not only aware but also actively engaged with digital learning tools.

- Collaboration between school boards and EdTech companies can foster an integrated curriculum where certain modules are delivered via digital platforms. This hybrid approach would improve students' digital literacy and bridge the gap between awareness and regular usage.

- Platforms should curate content that aligns with Indian school syllabi, particularly the NCERT and state board curricula, to make them more relatable and immediately useful for students. This could increase the adoption rate for core subjects beyond extracurricular interests.

- Free platforms should be promoted more actively, especially in low-income and rural sectors. Multilingual content delivery can significantly enhance accessibility. Government and non-profits should ensure widespread dissemination of information about these resources.

- Although the study indicates no significant gender-based difference in usage or awareness, it is important to ensure equitable access by encouraging digital usage among all genders in conservative regions where latent disparities might exist due to social norms or technological access at home.

- Teachers play a crucial role in influencing student behaviour. Training programs to familiarize educators with digital tools can encourage them to promote their usage in classroom teaching and assignments.

- Since parents of school-going students often influence their learning habits, awareness programs targeting parents can help them support and monitor their children's use of digital learning platforms constructively.

Future Scope of the Study

The present research provides a foundation for further exploration into the domain of digital education among school students. Several future directions are suggested to broaden and deepen the understanding of this emerging field:

- Future studies should expand beyond the Tricity region (Chandigarh, Mohali, Panchkula) to include rural and urban areas across different states for a more representative national outlook.
- Conduct long-term studies to evaluate how students' awareness and usage of digital platforms evolve over time, especially in the post-COVID-19 educational environment.
- Examine differences in digital education adoption between public and private school students to identify socio-economic and infrastructural disparities.
- Assess whether the use of digital platforms leads to measurable improvements in academic performance, knowledge retention, and student engagement.
- Investigate psychological, economic, technological, or infrastructural challenges that may prevent students from effectively using digital learning platforms.
- Align future research with the National Education Policy (NEP) 2020 to evaluate how digital platform usage supports or diverges from national educational goals.

Conclusion

In conclusion, this study highlights the pivotal role that awareness plays in driving the usage of online education platforms among higher secondary students. The findings clearly indicate that while gender does not serve as a significant determinant in either awareness or usage, there exists a strong and statistically meaningful relationship between students' awareness of digital platforms and their actual engagement with them. This suggests that efforts to improve adoption must begin with well-structured and inclusive awareness initiatives. By developing targeted digital literacy programs within schools and communities, educational stakeholders can empower students to explore, understand, and effectively utilize a wide range of online learning tools. Fostering digital competence at an early stage is not only essential for personal academic advancement but also for ensuring the successful and equitable integration of digital education within India's broader educational framework. As the country continues to embrace the potential of EdTech, prioritizing accessibility, inclusivity, and digital readiness will be crucial in shaping a more robust and future-ready education system.

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